THE RELATIVE EFFECTIVENESS OF MOTHERS AND FATHERS AS SOCIAL REINFORCING AGENTS WITH PRESCHOOL CHILDREN

by

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It was the purpose of this study to investigate the effectiveness of mothers and fathers as social reinforcing agents for their preschool children on a simple motor task. It was hypothesized that there would be no difference between five-year-old males and five-year-old females in their responses to parental social reinforcement. It was also hypothesized that there would be no difference in the effectiveness of mothers and fathers as social reinforcing agents for their preschool-age daughters and/or sons.

The subjects were 40 boys and girls, aged five to six years, and one of their parents. All of the subjects were drawn randomly from a pool of families who were interested to cooperate in the study.

The data were collected, using a variation of the Gewirtz and Baer (1958A) Marble-in-the-hole game. Difference scores were analyzed with the Mann-Whitney nonparametric U test. The significance level was set at the .05 critical value for a two-tailed test.

Null hypothesis one, that there would be no difference between preschool boys and preschool girls in their response to social reinforcement by a parent, was rejected. Concerning null hypotheses two and three, that there would be no difference between mothers and fathers as social reinforcing agents with their preschool daughters and sons respectively, the data were not sufficient for rejection at the .05 level.

The major conclusions were as follows:

1. Preschool females are more responsive to parental social reinforcement than are preschool males.
2. The data did not support the hypothesis that there is a difference in effectiveness between mothers and fathers as social reinforcing agents for their preschool children.

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CHAPTER I

INTRODUCTION

Traditionally, the roles of male, female, mother-father, and parent-child, have been clear-cut and well defined. The mother has been the main stabilizing force in the family (Klemer, 1970). This traditional role is clearly stated in both "The Iliad" and "The Odyssey" of Homer (Butler, 1952) which are two of the oldest literary works of Western civilization. It has been the mother's duty to keep the home, rear the children, and serve her husband. Even in the 20th century, when some mention of child rearing is made in the most casual of conversations, it is assumed that the mother is the parent in question (Klemer, 1970; Bowlby, 1958). This is true also to a large extent in academic circles. The lack of research relating to the father as a primary socialization agent of children is frequently noted (Medinnus, 1967; Mussen, Conger, and Kagan, 1970; Seidman, 1969; Stendler, 1964; Hoffman and Hoffman, 1964; McCandless, 1967; and Sears, Maccoby, and Levin, 1957). When the father and his influence have been studied, most often the data were obtained by interviewing the mother or child, asking how the father behaves (Sears, Maccoby, and Levin, 1957; Sears, Pintler, and Sears, 1946). The family situation is, however, rapidly changing (Klemer, 1970), and the father is becoming an equal partner in the duties of the home and child rearing (Erikson, 1963; Sears, Maccoby, and Levin, 1957; and Maier, 1965).

The changing social roles and changing family structure have made it imperative that child development researchers concern themselves with the father-child relationship as well as the mother-child relationship, which has received so much attention in the past.

Many authors assume that the parents and the family exert the most important social-personal influence on the child (McCandless, 1967). Aside from the physical differences in human beings, i.e., those differences which are genetically controlled, there is an infinite variety of individual differences which are largely due to social, emotional, and intellectual learning opportunities which individuals have available to them. McCandless (1967) called these learning opportunities culture. From this point of view it is reasoned that the relation between parents and children is a two-way street: "parents influence child, child influences parents" (McCandless, 1967). Much of the literature which investigates this relationship is based on the primary assumption that a child's social behavior is learned (Bijou and Baer, 1961, 1965; Hull, 1952; Skinner, 1953) through rough observation (Ausubel, 1958), model imitation (Bandura, 1963; Parsons and Shils, 1951), and verbal mediation which has social reinforcement as a major faction in its acquisition (Krasner, 1963; Parsons, 1953).

If this reasoning is valid, and if the assumptions are true, then social reinforcement is responsible for a large part of the child's socialization. It was, therefore, the purpose of this study to investigate the effectiveness of both the mother and the father as social reinforcing agent for his or her preschool child on a simple motor task.

The following three hypostheses were formulated and tested.

1. There are no differences between preschool boys and preschool girls in their responses to a parent as a social reinforcing agent.

2. There are no differences in the effectiveness between mothers and fathers as a social reinforcing agent with their preschool daughters.

3. There are no differences in the effectiveness between mothers and fathers as a social reinforcing agent with their preschool sons.

Most of the studies dealing with social reinforcement reported since 1965 have utilized a variation of the "Marble Game." Some used a longer or shorter baseline and reinforcement periods, or a larger supply of marbles, or a greater number of holes into which the marbles could be dropped. A modified variation of the Gewirtz-Baer (1958A) marble game was used to measure the effectiveness of the mothers and fathers as social reinforcing agent for their preschool child.

No study was found in the literature which addressed itself to the effectiveness of mothers and fathers as social reinforcing agents with preschool children.

CHAPTER II

REVIEW OF LITERATURE

The review of literature has been divided into three sections: Social Reinforcement with Children; Measuring Techniques; and Experimenter Effects.

Social Reinforcement with Children

From a review of the literature up to 1965, dealing with attempts to assess directly the adult's reinforcement effectiveness on children's operant behavior, Edwards (1965) made the six following broad generalizations:

1. Adults can affect a child's rate of performance, his performance of one response in a two response task, and time spent at a task by using verbally mediated social reinforcement.

2. Verbally mediated social reinforcement has consisted of praise, criticism, or direct knowledge of the correctness of performance. These types of reinforcement interact with characteristics of the reinforcement agent and child in influencing effectiveness of reinforcement; there is no clear evidence of the relationship between type of reinforcement, characteristics of reinforcing agent, characteristics of child, and whether performance is increased or decreased.

3. Social reinforcement interacts with model attributes of parents and other adults as they attempt to control child behavior.

4. Variables associated with the child which influence the effectiveness of social reinforcement are: age, sex, intelligence, socio-economic status, degree of general social isolation prior to reinforcement, degree of satiation prior to reinforcement, and strength of dependency needs.

5. Variables associated with the reinforcing agent which influence effectiveness of social reinforcement are: sex, "general demeanor," familiarity with child, and whether parent or non parent.

6. There is an interaction between the characteristics of the child and the agent of reinforcement which influences the effectiveness of reinforcement [pp. 37-38].

Lindsley (1963) has suggested that free-operant conditioning might be utilized as a means of studying social behavior. He made this suggestion on the contention that largely what is generally considered to be social behavior can be shown to follow the same laws as individual behavior, the only observable difference being that, in situations considered to be social, the stimuli are presented by an independent organism. It has been pointed out elsewhere that Long, et al. (1958), had clearly demonstrated the feasibility of controlling the operant behavior of children by means of various schedules of reinforcement by using mechanical manipulanda and a variety of reinforcement schedules (Edwards, 1966; Long, Flammack, and Campbell, 1958).

Rachman (1962) has defined social reinforcement as "any event mediated by a person which has the effect of increasing the strength of the behavior which immediately preceded it." Edwards (1965) has pointed out, however, that it is necessary to broaden this definition.

> In reviewing the literature it is very apparent that the concept of social reinforcement is used in a wider context; to be more accurate, social reinforcement should be defined as any event mediated by a person which has the effect of increasing (positive social reinforcement) or decreasing (negative social reinforcement) the strength of the behavior which immediately preceded it [p. 22].

Measuring Techniques

Several questions have been raised concerning the techniques used as measures of adults' effectiveness as reinforcement agents for children. Parton and Ross (1965) focused their review of the literature, dealing with the influence of verbal reinforcement on children's repetitive motor-task performance, on the apparent deficiencies in methodology (or design) of the studies which they reviewed. They contended that the omission of control groups has frequently resulted in the confounding of reinforcer effects with "regression-to-the-mean" or warm-up effects. Also cited as a problem by Parton and Ross (1965), was the use of difference scores. Rate-increase scores based on observing whether the subject speeds up after introduction of the reinforcer are typically difference scores derived by subtracting the response rate during a base period from the response rate during an experimental period.

Parton and Ross (1965) stated that some of the studies covered in their review contained the questionable assumption that in the absence of reinforcement the response rate of children was stable over time. According to their point of view this assumption has led to studies lacking non-reinforced control groups in which each subject is thought to be "his own control" (Grossman, 1963; Stevenson, 1961; Stevenson, Keen, & Knights, 1963; Stevenson & Knights, 1962; Stevenson and Odom, 1962).

Parton and Ross (1965) made the following statement:

> It is unlikely, however, that measures based on brief base periods can serve as controls for time-regulated changes such as warm-up effects, fatigue effects, and

> the effects of subjects' varying hypotheses and motivational states [p. 67].

In concluding their review, Parton and Ross (1965) stated in effect that the precise application of operant methodology has proven of value in the study of reinforcement effects with children (Bijou & Baer, 1963; Long, et al., 1958). They charge, however, that operant technique has been abbreviated by the use of only one estimation of baseline performance and one estimation of reinforced performance. It is suggested that if the investigator is serious about adopting an operant approach, repeated assessments of baseline and reinforced performance should be obtained in order to show whether a reliable reinforcement effect is present. Regarding the assumption that tasks must have low intrinsic interest, Parton and Ross (1965) contend that when intrinsic interest is low the subject's continued performance is evidently a function of the experiementer's instructions, which suggests that performance is aimed at obtaining or maintaining the experimenter's approval. In keeping with this line of reasoning Parton and Ross (1965) suggest that to a great extent baseline performance may be contingent on the subject's desire for social approval.

In response to the review by Parton and Ross (1965), Stevenson and Hill (1966) rebutted in defense of the use of rate as a measure of adult effectiveness as reinforcing agents of children's motor behavior. Using studies more recent than those reviewed by Parton and Ross (1965), Stevenson and Hill (1966) cited data which they claimed gave more information about the reliabilities of the base-rate score. Stevenson and Hill (1966) also offered a study

done by Siegel (1965) as evidence for their point of view. Working with white children, Siegel obtained a test-retest correlation of .88 for the base rate measure. However, the correlation coefficient for a group of Negro preschool children was only .34 (Siegel, 1965).

Concerning difference scores, Stevenson and Hill (1966) reported that "the general tendency, therefore, is for the difference scores . . . to remain relatively stable orders across successive minutes and to show adequate reliability for most statistical purposes [p. 322]."

In conclusion, Stevenson and Hill (1966) stated that the effects of praise and other responses of adults to children had been found to be extraordinarily complex. Although there seemed to be many problems in the assessment of the effects of social reinforcement on children's behavior, present techniques are apparently sufficiently sensitive indicators of the effects of social reinforcement to reveal some of these complex effects.

As a reply to the conclusions and suggestions advanced by Stevenson and Hill (1966), Parton and Ross (1967) stated:

> Stevenson and Hill have made an important contribution by presenting results which indicate that rate change scores reflect systematic variance unrelated to the social reinforcement manipulation. This finding emphasizes the ambiguity inherent in past interpretations of studies which have failed to include non-reinforcement control groups. The need for a variety of control conditions is indicated by the observation that currently we do not have experimental results which indicate whether praise words produce effects which differ from the effects of nonsense words [p. 324].

Rosenfeld (1967) has reported a study which throws some light on the above-presented argument. He suggested that the maintenance

of free social interaction might be due in part to the normative reciprocation of common approval-related responses. He designed an experiment to provide a demonstration of such reciprocation. Students were given a standard interview by an adult. The interviewer followed each answer of the student with either approving responses (smile, positive head nod, verbal acknowledgment, and gesticulation), disapproving responses (frown, negative head nod, and verbal disparagement), or no response. The student emitted significantly higher percentages of smiles and positive head nods in responding to the approving interviews than to the disapproving or nonresponsive interviews. As anticipated, the students responded with their lowest percentages of self-manipulatory responses and "non-ah" speech disturbances in the approving interviews. The results of this study support the notion of a reinforcement-feedback system which may be a major determinant of the social interaction process. From these arguments it can be concluded that, possibly, the best way to resolve the difficulties of measuring the effectiveness of an adult's influence pertaining to a child's motor behavior is to control the rate of response and to use a significant adult as the reinforcing agent.

Edwards (1966) concluded that the Gewirtz-Baer marble-dropping task is not a suitable method for measuring the effectiveness of parents as social reinforcing agents for their children. He suggested that future research on social reinforcement using parents as reinforcing agents during a marble-dropping task should be simplified

in order to provide a less complex measure of behavior. He suggested two possible ways.

> First, rate of marble dropping by the child can be controlled by providing the child with one marble at a time on a fixed time schedule so that the only response the child can make is related to choice of the hole into which he can place the marble; preference change then becomes a less contaminated criterion measure. Second, preference of hole into which the marble can be dropped can be eliminated by providing only one hole into which marbles can be dropped; in this case rate of response becomes a less contaminated criterion measure [p. 93].

Both of these methods of behavior measurement are important in relation to everyday living patterns. Parents are always attempting to change or speed up the child's ongoing behavior (Sigel, Hoffman, Dreyer, and Tergoff, 1957).

Concerning the question of direction of change and magnitude of change in relation to measuring social reinforcement by rate of reinforcement, Baron, Reuben, and Robinson (1968) showed that both direction of change and magnitude of change had important implications for the study of social reinforcement.

Experimenter Effects

Another problem area suggested by the literature since 1965 concerns the race and sex of the experimenter. Phillips (1966) found that over-all responsiveness and changes in the rate of responding after the onset of one of three conditions of social reinforcement (praise, silence, or criticism) were related to the race and sex of the adult reinforcing agent. The data for this study were collected as two measures of performance on the "Marble Game" from 240 father-present and father-absent ten-year-old Negro boys from deprived homes in the urban South.

Also in keeping with the finding of Phillips (1966), cited above, is an earlier study reported by Stevenson and Hill (1965), concerning the effects of social reinforcement and nonreinforcement following success and failure, which suggests that an unresponsive experimenter may often, though unintendingly, have significant effects on the performance of the subjects. As cited earlier (Siegel, 1965; and Stevenson and Hill, 1966), Negro preschool children did not perform in the same manner as did white children under the same experimental conditions.

Allen (1966) reported a study utilizing 90 male kindergarten students which was concerned with verbal reinforcement as a function of the task. His data indicated that when the experimenter was supportive, the subjects remained at the task longer and relied more strongly on the adult's evaluation of their performance than when the experimenter was neutral or negative.

McGrade (1966) showed that older subjects from the lower socioeconomic class were more responsive to positive social reinforcement than were younger middle-class subjects. In this same area, McMorris (1966) reported data which indicated that social reinforcement in the form of praise was more effective than reproof. When paired with competition, praise exceeded reproof also paired with competition.

The data of Hunt and Battig (1966) showed that subjects who were consistently reinforced for either affective or non-affective words showed no verbal conditioning differences, however, both showed facilitated tachistoscopic recognition of emotional words.

Sgan (1967) reported a study which indicated that working-class males were significantly less susceptible to experimenter influence than either working-class females or middle-class males or females.

Lott and Lott (1969) reported data which supported the hypothesis that the person who is liked can function as a positive reinforcing agent and that the person who is disliked can be identified as a negative reinforcing agent.

It should be pointed out that Maier (1965) reported an unpublished manuscript by Sears (1967) which indicated that "Girls, . . ., remain more sensitive to mother's approval and disapproval [p. 171]." In contrast, the males' identification is far more complicated by the fact that they must, to a considerable degree, relinquish their identification with the mother and also because the male depends upon the father's capacity and availability to exhibit a combination of warmth and love-oriented discipline techniques. "Father identification in boys is enhanced if the father can be a clear and unequivocal model, acknowledged and esteemed by the mother [Maier, 1965, p. 171]."

The same can be assumed as true for females if the father justifies the female's esteem by conveying respect and appreciation for the mother through his behavior towards her. Sears (1957) also pointed out that as the child nears school age, he tends to live out the characteristics of the person he identifies with most strongly.

Edwards (1966) in discussing his data stated:

> There is no evidence in any of the test data that offering praise or withdrawing praise during a simple motor task affects the child's performance.

> There is a suggestion that mothers of high socio-economic girls tend to increase the magnitude of their daughters' performance through praising, but this is possibly a chance finding [p. 98].

The review of pertinent literature, since 1965 to the present date, which deals with attempts, methods, and other related areas, to assess directly the reinforcement effectiveness of adults on children's operant behavior, has not uncovered any data which challenge the validity of the six generalizations made by Edwards (1966); therefore, they will be accepted as valid.

Three other generalizations have been added by the experimenter to those of Edwards (1966).

1. Possibly, the best way to resolve the difficulties in measuring the effectiveness of adults' use of social reinforcement on children's motor behavior is to control the rate of response and utilize difference scores rather than rate.

2. The experimenter should be an individual who likes children and who relates well to children.

3. The parent should use the same tone and fluctuation of voice as he does at home when reinforcing the child's behavior.

From the literature reviewed, it is assumed that social reinforcement is effective with preschool children and that both parents use verbal/social reinforcement in influencing their child's behavior.

CHAPTER III

METHOD AND PROCEDURES

To test the apparatus and task, a pilot study was conducted by the experimenter using three- and four-year-old university nursery school children and their parents as subjects. The results of this pilot project indicated that the task, as designed, was not appropriate for children of three and four years of age. The subjects tended to hoard the marbles and to become bored with the game during the baseline and reinforcement period. A reduction in the duration of time for each phase failed to produce sufficient change in the subjects' behavior to warrant running the actual experiment with children of this age.

A second pilot project, using five-year-old kindergarten children and their parents indicated that the task was better suited to this age child. It succeeded in holding their attention and interest. The experimental periods were cut from the intended three minutes to two minutes each so as not to strain the child's endurance. The pilot data indicated that an adequate baseline was obtainable in two minutes.

Subjects and Sampling Procedure

The subjects in the principal study were 40 five-year-old children of both sexes who were enrolled in local kindergartens and whose parents were willing to participate in the study. (See Appendix A for letter to local kindergartens requesting a list of their students.)

Two hundred individually typed form letters were mailed to prospective subjects requesting that they participate in the study. (See Appendix A for letter to subjects.) One hundred and fifty replied, with 96 agreeing to take part. The pool of prospective subjects thus was 96. Sixty subjects were randomly selected and scheduled to take part in the study. After cancelations and various other difficulties, the experiment was conducted with 40 of these randomly selected subjects, there were 20 females and 20 males; ten of each with the mother and ten with the father. Based on observation and conversation with the parents, it was clear that all of the families were middle-class.

Site of Study

The experiment was conducted on the Greensboro College campus during the fall semester of 1969 on Saturday mornings between the hours of 8:00 a.m. and 12:00 noon. The laboratory was situated in a well-lighted, pleasant location which could best be described as neutral.

The families were notified individually as to which parent had been randomly selected to participate in the study. Also, each family was telephoned to set up a convenient appointment during the aforementioned time period. Follow-up telephone calls were made to insure that each family was completely informed as to which parent was to play the game with his/her child at the appointed time.

Hot coffee and doughnuts were served the parents by two assistants as they arrived for their appointment. Each child subject was

given an approximately fifteen-minute period of time to get used to the environment. The assistants talked with the children and played marble games with them on the floor, using the same kind of marbles which were later to be used in the marble-in-the-hole game.

The parent was taken by an assistant to the experimental room which was located just off the reception area. The game was explained to the parent, emphasizing that the parent understood the cue light system and that he was to reinforce the child's behavior only when the correct response was made during the reinforcement period. The experimental assistant then excused herself and went to the reception area to get the child. (See Appendix B for instructions to parent.)

When the child arrived at the experimental room the assistant demonstrated the game to the child. After the child understood what he was to do the assistant started the baseline time by activating a stop watch. The assistant remained in the experimental room during the entire three periods. After the game was ended the experimental assistant thanked the child and his parent for playing the game and gave the child a small toy as a gift. (See Appendix B for instructions to child.) The child and parent then left the building and another cycle began. Each cycle lasted approximately ten to twelve minutes including the instruction time. The subjects were scheduled at fifteen-minute intervals to allow for a socialization period.

The Apparatus

The apparatus most used in studying the effect of social reinforcement upon a child's behavior is the "Marble Game" as outlined by Gewirtz and Baer (1958A).

> The task for the subject is to drop marbles into a toy while the examiner looks on. The toy is a wooden, angular box, having two holes at its forward top into which marbles could be dropped, and an open tray at its base where they return. The tray contains six marbles, identical in size but different in color, which could be used repeatedly. The experimental room contains two chairs, a couch, and a low table upon which the toy rests. Each subject sits before the toy and the subject is told that he could drop marbles down either hole, but that he must drop only one at a time. The examiner then observes subject's play for a 'baseline' period, during which reinforcers were not dispensed, until the subject's responses appeared relatively stable (typically four minutes). Meanwhile, the examiner responded to the subjects and questions in a friendly but brief manner. Without pause, the ten-minute test of reinforcer effectiveness began, as a continuation of the baseline. The examiner proceeds to dispense the reinforcer according to a schedule immediately after the subject dropped marbles into the hole preferred least during the last minute of the baseline. The reinforcer, designed to appeal primarily to the concept of approval, consisted most frequently of the word 'good' [p. 167].

The exchange of arguments between Parton and Ross (1965, 1967) and Stevenson and Hill (1966) indicated that probably the best method of modifying the Gewirtz-Baer marble-dropping task was to provide the child with one marble at a time. Therefore, the apparatus used in the present study was designed and constructed utilizing an electronic marble dispensing unit which was controlled by a tape type timing device. (See Appendix D for Schema of Apparatus.)

The mother's or father's effectiveness as social reinforcers of their child's behavior was measured, using the modified variation of the "Marble Game," described by Gewirtz and Baer (1958A). The apparatus used in the present experiment was designed and built by the experimenter and consisted of a console unit 30" x 15½" x 20". The entire unit was covered with plywood. Centered and to the front of

the smallest portion were two 5/8" holes placed side by side, separated by two inches of space. These were the holes into which the child dropped the marbles. Solid blue marbles were dispensed by a timed marble dispenser at a rate of 23 per minute. The entire apparatus was painted grey.

A yellow circle was painted around each hole to accentuate the openings. Beneath each opening was installed a micro-switch which was activated by the player each time a marble was dropped through the opening. These two micro-switches were connected to two electrical counters which generated data from each hole and recorded the total number of marbles dropped. The entire apparatus was insulated with foam rubber to muffle unwanted sounds.

On the side of the console opposite from the place where the child stood to play the game, two microlights were recessed in a horizontal position corresponding to the two openings on the top of the unit. These lights were controlled by the experimenter from his central control panel. The purpose of the lights was to indicate to the parent when to reinforce their child's behavior.

The Experiment

The experiment consisted of three consecutive parts which lasted two minutes each. Each child played the entire six-minute "game" without interruption. The first two-minute period was to produce a measure of baseline behavior. There was no measurable interaction between parent and child during this time. The least preferred hole was determined at the completion of this first two-minute period and the

light corresponding to this hole was turned on and left on for the second two-minute period. This second two-minute period was the reinforcement period. When the light came on, the parent verbally praised the child, "in the same manner as at home," every time a marble was dropped into the hole indicated by the light; i.e., the least preferred hole. This provided a 1:1 ratio schedule of reinforcement to the least preferred hole. All lights were turned off during the final period. There was no measurable interaction between the parent and child during the final period, thus serving as an extinction phase. The game was stopped by the experimenter. The total number of marbles dropped during each phase was recorded electrically for each hole.

The direction of preference change (increase or decrease) was obtained for boys and for girls from the baseline period to reinforcement period and from reinforcement period to extinction period as related to sex of the parent.

CHAPTER IV

RESULTS

The recordings of the reinforcement period and extinction period were cumulative since the game was played uninterrupted for the entire six minutes. The frequencies were recorded at the end of each two-minute period which yielded three separate scores.

In addition to the cumulative nature of the data, there was a tendency for some of the subjects to hoard the marbles as well as an occasional malfunction of the electronic marble-dispensing device. The number of marbles dropped and dispensed during the individual periods of the game were not equal. (The set frequency of marbles to be dispensed was 23 per minute.) To compensate for this condition, a leveling score was developed by Dr. Lumsden of the University of North Carolina at Greensboro. The score will be referred to as the "L" score and is computed in the following manner. (See Appendix C for alternative method of computing "L".)

$$L_1 = \frac{\frac{BL_{1p} - R_{1p}}{BL_{1p}}}{\frac{BL_{mp} - R_{mp}}{BL_{mp}}} \qquad \text{[Formula 1]}$$

In the language of logic this shows that the reinforcement frequencies of the least preferred hole (R_{1p}) are subtracted from the baseline frequencies of the least preferred hole and divided by the baseline frequencies of the least preferred hole. This value is

then divided by a value obtained by identically computing the baseline frequencies of the most preferred hole less the reinforcement frequencies of the most preferred hole, divided by the baseline frequencies of the most preferred hole. This score gives the percentage of change to the reinforced hole compared to the percentage of change to the unreinforced hole. (The least preferred hole was the reinforced hole.)

By chance alone, it could be expected that the "L" score would be 1. Therefore, any "L" score greater than 1 would indicate a greater increase in the reinforced hole; a "L" score less than one would indicate less change in the reinforced hole or negative reinforcement.

Reinforcement theory states that differential effects of reinforcement are identifiable in the extent to which the reinforced behavior resisted extinction.

Logically speaking then, it is possible that the greatest effects of reinforcement on a given pattern of behavior will be observed during the extinction phase. For this reason a second "L" score was computed utilizing Formula 2.

$$L_2 = \frac{\frac{BL_{1p} - Ext._{1p}}{BL_{1p}}}{\frac{BL_{mp} - Ext._{mp}}{BL_{mp}}} \qquad \text{Formula 2}$$

It should be noted that in Formula 2, the extinction value was cumulative and represents both, the frequencies from the reinforcement period, and the frequencies from the extinction period. Nevertheless, the derived value was a relative one and served the purpose of the

computation. (See Appendix C for an alternative method of computing "L".)

Boneau (1960) stated:

> . . . that for a large number of situations confronting the researchers, the use of the ordinary t test (and F test) . . . will result in probability statements which are accurate to a high degree, even though the assumptions of homogeneity of variance and normality of the underlying distributions are untenable [p. 54].

Guilford (1965) and Snedecor (1966) have stated basically the same in their works concerning statistical analysis. In light of the sampling procedure, however, the Mann-Whitney U Test appears to be the best statistical method for analysis.

Statistics

The Mann-Whitney U Test, a nonparametric statistic, which can be used if at least ordinal measurement has been achieved, was utilized in the analysis of the "L" score data. In essence, the Mann-Whitney U Test is designed to test whether two independent groups have been drawn from the same population. Siegel (1956) states:

> This is one of the most powerful of the nonparametric tests, and it is a most useful alternative to the parametric t test when the researcher wishes to avoid the t test's assumptions, or when the measurement in the research is weaker than interval scaling [p. 116].

The results are presented in Table 1.

TABLE 1

Summary of Analysis Utilizing
the Mann-Whitney U Test
Table K

Hypothesis	$Observed_{F1}$	$Observed_{F2}$	K Table U'
1. Boys versus girls as respondents to social reinforcement by a parent	56*	55*	127
2. Mothers versus fathers with preschool daughters	35	29	23
3. Mothers versus fathers with preschool sons	51	53	23

Note.--Table K (Siegel, 1956, pp. 274-277) gives critical values of U for significance levels .001, .01, .025, and .05 for a one-tailed test. For a two-tailed test, the significance levels given are .002, .02, .05, and .10.

*$p < .05$.

CHAPTER V

DISCUSSION

Regarding hypothesis one, the data clearly indicated that there was a significant difference between five-year-old males and five-year-old females in their responses to social reinforcement from a parent. Five-year-old girls showed a much greater response than did five-year-old boys. Analysis of the data (Table 1) showed that the difference in favor of girls was significant at the .05 level for a two-tailed test. Incidentally, the difference was also significant at the .002 level for a two-tailed test. These data supported the conclusion drawn by Sears (1957B) and the statement made by Edwards (1966) in his discussion.

In addition, Sears (1970), offered more support for this finding in a study concerning the relation of early socialization experiences of self-concepts and gender role in middle childhood. In discussing parental attitudes toward a child which give the child a feeling of being loved, wanted, accepted, and respected, Sears (1970) stated that these attitudes should induce a similar attitude in him. The method of transmitting these evaluative attitudes is presumably social reinforcement from loved persons who serve "not only as reinforcers but as models [p. 269]."

Sears (1970) stated further that:

> A complication in this otherwise simple prediction stems from the unequal participation of the two parents

> in the caretaking process, and the differences in the roles they play with children of the two sexes. In the first few years of life, the mother is the chief caretaker for both boys and girls. By age 5, however, the father is becoming more salient in the family interaction process, and during the subsequent 7 years he is an especially significant model for the boy. If one hypothesizes either a process such as indentification (primary for the girl and defensive for the boy), or a sex-typing process based on imitation of an idealized gender model, in part represented by the parent of the same sex, that parent should gain greater reinforcing power than the parent of the opposite sex. The reasoning is that since the same-sexed parent is the model whose behavior and attitudes the child is trying hardest to emulate --to be like --he should pay more attention to that parent and respond more readily to relevant cues from him for shaping his own behavior.
>
> The expected outcome of this state of affairs is that the mother's warmth and acceptingness would influence the self-concepts of both boys and girls but be more strongly evidenced in the girls than the boys. The father's warmth, however, should be more influential for the boys' self-concepts than for the girls'. He enters relatively late into the reinforcing process, and never is the approved gender role model for the girl, but he does become so for the boy. If he thus gains more reinforcing power, as is here assumed, the boy should show his influence more than the girl [p. 270].

Concerning hypothesis two, that there was no difference between mothers and fathers as social reinforcing agents for their preschool daughters, the data were not sufficient to reject the null hypothesis at the .05 level. In all cases the girls' "L" scores were higher with the mother which indicates that mothers were more effective as social reinforcing agents but the data were not sufficient to warrant an affirmative statement.

The computations of the data in relation to hypothesis three, that there was no difference between mothers and fathers as social reinforcing agents for their preschool sons, were not sufficient to

reject the null hypothesis at the .05 level. The indications were in the same direction as that of Sears (1970). The boys' "L" scores were generally higher with the mother than with the father, but U did not meet the critical value at the .05 level.

From a global point of view, the data tended to support Edwards' finding (1966) that by controlling the frequencies, i.e., dispensing one marble at a time on a fixed schedule, a difference score becomes more meaningful. Of course, with the young child there was still the tendency to hoard the marbles until he had several so that he could put them all in at one time. Furthermore, electronic apparatus was not as infallible as manufacturers of such items would have one believe. The "L" score takes care of this problem, however, and the difference score remains valid.

From observation, fathers had a tendency to be ill at ease with their children when in the company of strangers or in an "academic" setting. Mothers, on the other hand, seemed more relaxed and sure of themselves in the matter of managing their children away from home. From a common sense point of view, this was probably due to the cultural expectations that coping with young children's behavior is not a suitable area of concern for grown men. Erikson (1963) and Klemer (1970) indicated, however, that the traditional roles of male and female are changing. Erikson (1963, Ch. 8) traced the development of the American identity. In essence he said that, with the events of two major wars, the American man's activities have changed, within the family as well as in his social life. The American

man can now admit some of his bisexual tendencies and admit such feminine interest as child care, homemaking, and other arts which in the past have been reserved as the sole domain of the female. He said that the American male has proven himself and his masculinity by his successful survival as a soldier and that his masculinity is not threatened by such feminine interest. This may well be true. However, the data of the present study did not seem to support it.

More research is needed in the area of the differences between mothers and fathers as social reinforcing agents for preschool children. It is also possible that other significant persons, i.e., teachers, etc., could be used as social reinforcing agents. The same task used in the present experiment could be used or the task could be modified to include more than two choices as well as the use of control groups. Concerning task modification, one could convert the task choice from two holes to four holes; each hole representing a different color, e.g., red, blue, green, and yellow. Baseline performance then should indicate the child's first color preference. Social reinforcement could then be employed to change the child's preference.

It was concluded that within the population sampled, preschool girls responded to parental reinforcement to a greater degree than did preschool boys, and that more research is needed in the area of differences between mothers and fathers as social reinforcing agents for preschool children. Suggestions for further research were made.

CHAPTER VI

SUMMARY AND CONCLUSIONS

It was the purpose of this study to investigate the effectiveness of mothers and fathers as social reinforcing agents for their preschool children on a simple motor task. It was hypothesized that there would be no difference between five-year-old males and five-year-old females in their responses to parental social reinforcement. It was further hypothesized that there would be no difference in the effectiveness of mothers and fathers as social reinforcing agents for their preschool-age daughters and/or sons.

The subjects were males and females, ages five to six years, with one of their parents. All of the subjects attended a nursery school or kindergarten in the Greensboro, North Carolina, area and were drawn randomly from a pool of families who expressed interest in participating in the study. The data were collected on the Greensboro College campus between the morning hours of 8:00 a.m. and 12:00 noon on Saturdays over a period of 15 weeks in the fall of 1969. Each family who was assigned to the pool of available subjects had to meet the following criteria: Both mother and father had agreed to participate even though only one would be chosen for the experiment; the family must be intact; both mother and father had to be the natural parents of the child. Each family was notified as to which parent had

been selected to participate and an appointment was made for playing the game with the child.

The data were collected, using a variation of the Gewirtz and Baer (1958A) Marble-in-the-hole game. Each playing period consisted of three two-minute periods: a baseline period, a reinforcement period, and an extinction period. Difference scores were converted to "L" scores and analyzed with the Mann-Whitney nonparametric U test. The significance level was set at the .05 critical value for a two-tailed test.

In testing null hypothesis one, that there would be no difference between preschool boys and preschool girls in their response to social reinforcement by a parent, the observed U value was 56. The value of U' with $n_1 = 20$ and $n_2 = 20$ in Table K of critical values of U for a two-tailed test at the .05 level is 127. Since the observed value of U = 56 was equal to or less than the Table K value of 127 the null hypothesis was rejected at the .05 level.

In testing null hypothesis two, that there would be no difference between mothers and fathers as social reinforcing agents with their preschool daughters, and the third, that there would be no difference between mothers and fathers as social reinforcing agents with their preschool sons, the observed values of U were 35 and 49 respectively. The value of U' with $n_1 = 10$ and $n_2 = 10$ in Table K of critical values of U for a two-tailed test at the .05 level is 23. Since the observed values of U = 35 for null hypothesis two and

U = 49 for null hypothesis three, both of which are greater than the Table K value of 23, both were failed to be rejected.

The major conclusions were as follows:

1. Preschool females are more responsive to parental social reinforcement than are preschool males.
2. The data did not support the hypothesis that there is a difference in effectiveness between mothers and fathers as social reinforcing agents for their preschool children.
3. More research is needed in the area of differences between mothers and fathers as social reinforcing agents with their preschool children.

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APPENDIX A

Correspondence Concerning Subjects

The following letter was mailed to 68 of the kindergarten directors in the area over the signature of the Dean of the College requesting their cooperation in securing subjects. Each letter was individually typed.

Date

Name and Address

Dear :

Mr. J. Don Everhart, a member of our faculty in child development, is carrying out a research project this fall studying the effects of verbal reinforcement (praise) on the child's performance on a simple motor task. We feel that this study will provide some important information not now available to us in the matter of verbal reinforcement with five-to-six-year-olds.

The experiment, which takes only 15-20 minutes and presents a task that is interesting to this age child, will include boys and girls, mothers and fathers, and will be conducted on Saturday mornings over the next two months.

The experimental sessions will be in the new Cowan Building on the Greensboro College campus under the auspices of a Greensboro College faculty research grant. We are asking all of the kindergartens in Greensboro and surrounding area to help with this study by furnishing a list of parents' names and addresses for all the five-year-old children in their schools. Mr. Everhart will then contact the families individually to give each an opportunity to participate in the study. Your help in this matter will be greatly appreciated.

A stamped self-addressed envelope is enclosed for your convenience. If making up an extra list presents any problem, Mr. Everhart can send someone to your kindergarten to copy the list for you. Please call him at 272-7102 during the normal working day or at 272-2533 after 5:30 p.m. if you wish this help or if you have questions.

We are encouraging Mr. Everhart to pursue this research, representing as it does a collaborative effort among the kindergartens of Greensboro and this institution of higher education. Your interest and support is crucial and is deeply appreciated.

Most sincerely,

Elmer L. Puryear
Dean of the College

After receiving the list of students from the kindergartens who responded to the above letter, the following letter was mailed to parents whose child met the age requirement.

Date

Name and Address

Dear Mr. and Mrs. :

Mr. J. Don everhart, a member of our faculty in child development, is carrying out a research project this fall studying the effects of verbal reinforcement (praise) on the child's performance on a simple motor task. We feel that this study will provide some important information not now available to us in the matter of verbal reinforcement with five-to-six-year-olds.

The experiment, which takes only 15-20 minutes and presents a task that is interesting to this age child, will include boys and girls, mothers and fathers, and will be conducted on Saturday mornings over the next two months.

The experimental sessions will be in the new Cowan Building on the Greensboro College campus under the auspices of a Greensboro College faculty research grant. We asked all of the kindergartens in Greensboro and surrounding area to help with this study by furnishing a list of parents' names and addresses for all the five-year-old children in their schools. Their response has been most encouraging. We would like for you and your five-year-old to take part in this study. Only one parent will be selected from each family; however, both parents must be willing to participate. The selection of the parent will be in a random manner so that the results of the study can be properly evaluated.

Please check the appropriate sections of the attached form indicating whether you and your child would like to take part in this study. We have enclosed a stamped self-addressed envelope for your convenience.

We are encouraging Mr. Everhart to pursue this research, representing as it does a collaborative effort among the kindergarten students, their parents, and this institution of higher education. Your interest and support is crucial and is deeply appreciated.

Sincerely yours,

Elmer L. Puryear
Dean of the College

This letter was also individually typed and individually signed by the Dean of the College. The following form was enclosed which facilitated the selection of and scheduling of the subjects. This form was also used to record the date.

GREENSBORO COLLEGE

Please check one and return in the self addressed and stamped envelope enclosed.

_____ We would like to take part in the study.

_____ We will not be able to take part in the study.

Child's Name: _____ Sex _____

Father's Name: _____

Mother's Name: _____

Address: _____

Telephone Number: (home)_____(business)_____

Please indicate a time when Mr. Everhart or, his assistant, Miss Aiken can contact you to set up a convenient appointment.

_____

DO NOT WRITE IN THIS SPACE

Appointment: _____ Call made by _____

Parent selected: M F

Baseline _____

Reinforcement _____

Extinction _____

APPENDIX B

Instructions to Parents and Children

INSTRUCTIONS TO THE PARENT

This is the marble-in-the-hole game. If you will please sit in that chair behind the box (Experimenter points to chair), I will remove the top and explain to you how it all works.

If you will notice, there are two holes here on the front of the top (Experimenter points to the two holes) which have yellow rings painted around them. Your child will stand here where I am in front of the box. The marbles will come out of the box into this tray (Experimenter points to tray). Your child (Experimenter uses child's name) is to get the marbles out of the tray just as soon as they come out and put them into either one of these two holes (Experimenter takes a marble out of her pocket, places it in the tray, takes it out of the tray and puts it into one of the two holes).

Now if you will notice the wires in the back of the box as I remove the top (Experimenter removes top and points to the wires). These wires lead to two blue lights which are recessed in the back side of the box right in front of you (Experimenter points to the two lights). Please notice that each light is aligned with the two holes on the top of the box, this light corresponds with this hole (Experimenter points to right light and traces a line to the right hole) and this light corresponds to this hole (Experimenter points to the left light and traces a line to the left hole). These lights will tell you when to praise <u>child's name</u> response.

After child's name comes in I will explain the game to (him or her) and show (him or her) how you play it. During this period you may make any comments you like which will put child's name at ease. However, when the game starts you must remain silent and say nothing until one of the lights comes on. This will occur after the first two minutes. When one of the lights comes on, you are to praise or show approval of child's name response when (he or she) places a marble in the hole corresponding to the lighted light (Experimenter points to one of the lights and traces a line to the corresponding hole). When the light goes out, you stop praising or showing approval of child's name responses and remain silent until the game is over. The machine will stop when the time is up. Do you have any questions? If not, I will replace the top and go get child's name . You may remain here if you like and I'll be right back with child's name .

Experimenter leaves the experimental room and walks across to the reception room to get the child who has been playing with two other assistants.

INSTRUCTIONS TO THE CHILD

(Experimenter approaches the child and calls him or her by name.)

Hello, child's name . I'm Experimenter's name . We are ready to play the marble-in-the-hole game now. Your mother or father is across the hall with the game and is waiting for us. (The assistants reinforce the idea of playing the game and offer to go along with the child if he or she seems hesitant to leave the toys in the reception room. Experimenter takes the child's hand and walks to the experimental room.) Here's your mother or father waiting for us to play the game. And here's the marble-in-the-hole game (Experimenter points to the apparatus). See, it's a big grey box with a tray on front and two holes with yellow circles painted around them on top (Experimenter points to the tray and traces a line to the holes.)

You are to stand here in front of the tray (Experimenter guides the child into the playing position and points to the tray). The marbles will come out of this hole in the back of the tray (Experimenter points to the hole in the tray). You are to get the marbles with your hand and put them into the two holes on the top of the box. Let me show you how it's done (Experimenter takes a few marbles out of her pocket and drops one into the tray, she then removes it and places it in one of the holes on the top of the box. This is repeated several times).

You get the next one I put in the tray and put it in a hole (Experimenter points to the two holes at the same time with two fingers).

When the game starts the marbles will come out of this hole I just showed you (Experimenter points to the hole in the back of the tray). Be sure to get the marble just as soon as it comes out and put it in one of the two holes, do not hold on to it, put it in a hole just as fast as you can. Are you ready to play the game now? (Experimenter activates the machine and a stop watch by a remote switch to start the game). Go!

APPENDIX C

Data and Computations

TABLE 2

"L" Scores for Formula 1 and Formula 2
Boys with Fathers

L_{F1} (n = 10)	L_{F2} (n = 10)
.577	.671
.916	.807
1.150	.978
1.238	1.187
1.251	1.272
1.277	1.327
1.312	1.840
1.722	2.320
2.174	2.323
4.364	3.267

TABLE 3

"L" Scores for Formula 1 and Formula 2
Boys with Mothers

L_{F1} (n = 10)	L_{F2} (n = 10)
.834	.864
1.013	1.068
1.136	1.121
1.136	1.150
1.185	1.232
1.333	1.339
1.555	1.458
2.039	1.588
2.167	1.976
3.044	2.216

TABLE 4

"L" Scores for Formula 1 and Formula 2
Girls with Fathers

L_{F1} (n = 10)	L_{F2} (n = 10)
.774	.828
.857	.854
.949	.951
1.294	1.050
1.358	1.234
1.493	1.321
2.035	2.048
2.087	2.073
3.059	2.821
3.900	2.985

TABLE 5

"L" Scores for Formula 1 and Formula 2
Girls with Mothers

L_{F1} (n = 10)	L_{F2} (n = 10)
.952	1.098
1.088	1.153
1.116	1.287
1.297	1.398
1.988	1.857
2.625	1.989
2.844	4.362
4.057	4.702
4.226	5.000
4.768	5.351

Dr. Kendon Smith, professor of psychology at the University of North Carolina at Greensboro, suggested that a modified version of "L" score formulas one and two would be simpler to compute and explain. Dr. Smith's modification of the "L" socre formulas is:

$$L_1 = \frac{\frac{R_{1p}}{BL_{1p}}}{\frac{R_{mp}}{BL_{mp}}}$$

$$L_2 = \frac{\frac{R_{1p} + E_{1p}}{BL_{1p}}}{\frac{R_{mp} + E_{mp}}{BL_{mp}}}$$

These formulas do not utilize the cumulative frequencies and no negative values are involved in the computations as there is with the formulas used in this study. Mathematically the formulas are the same and the same values are obtained.

TABLE 6

Mann-Whitney U Test, Formula 1
Boys' Versus Girls' Response to a Parent
as a Social Reinforcing Agent

Boy L_{F1} (n = 20)	Rank	Girl L_{F1} (n = 20)	Rank
.577	1	.774	2
.834	3	.857	4
.916	5	.949	6
1.018	8	.952	7
1.136	10	1.088	9
1.136	12	1.116	11
1.150	13	1.294	18
1.185	14	1.297	19
1.238	15	1.358	22
1.251	16	1.493	23
1.277	17	1.988	26
1.312	20	2.035	27
1.333	21	2.087	29
1.555	24	2.625	32
1.722	25	2.844	33
2.039	28	3.059	35
2.167	30	3.900	36
2.174	31	4.057	37
3.044	34	4.226	38
4.364	39	4.768	40
	$R_1 = 366$		$R_2 = 454$

Note.-- U' at the .05 level of significance two-tailed test = 127.

$$U = n_1 n_2 + \frac{n_2(n_2+1)}{2} - R_2$$

U = 56 Significant at the .05 level.

TABLE 7

Mann-Whitney U Test, Formula 2
Boys' Versus Girls' Response to a Parent
as a Social Reinforcing Agent

Boy L_{F2} (n = 20)	Rank	Girl L_{F2} (n = 20)	Rank
.671	1	.828	3
.807	2	.854	4
.864	5	.951	6
.978	7	1.050	8
1.068	9	1.098	10
1.121	11	1.153	13
1.150	12	1.237	16
1.187	14	1.287	18
1.232	15	1.321	19
1.272	17	1.398	22
1.327	20	1.857	26
1.339	21	1.989	28
1.458	23	2.048	29
1.588	24	2.073	30
1.840	25	2.821	34
1.976	27	2.985	35
2.216	31	4.362	37
2.320	32	4.702	38
2.323	33	5.000	39
3.267	36	5.351	40
	$R_1 = 365$		$R_2 = 455$

Note.-- U' at the .05 level of significance two-tailed test = 127.

$$U = n_1 n_2 + \frac{n_2(n_2+1)}{2} - R_2$$

U = 55 Significant at the .05 level.

TABLE 8

Mann-Whitney U Test, Formula 1
Mothers Versus Fathers as Social Reinforcing
Agents with Their Preschool Daughters

Father L_{F1} (n = 10	Rank	Mother L_{F1} (n = 10)	Rank
.774	1	.952	4
.857	2	1.088	5
.949	3	1.116	6
1.294	7	1.297	8
1.358	9	1.988	11
1.493	10	2.625	14
2.035	12	2.844	15
2.087	13	4.057	18
3.059	16	4.226	19
3.900	17	4.768	20
	$R_1 = 90$		$R_2 = 120$

Note.-- U' at the .05 level of significance two-tailed test = 23.

$$U = n_1 n_2 + \frac{n_2(n_2+1)}{2} - R_2$$

U = 35 not significant at the .05 level.

TABLE 9

Mann-Whitney U Test, Formula 2
Mothers Versus Fathers as Social Reinforcing Agents with Their Preschool Daughters

Father L_{F2} (n = 10	Rank	Mother L_{F2} (n = 10)	Rank
.828	1	1.098	5
.854	2	1.153	6
.951	3	1.287	8
1.050	4	1.398	10
1.234	7	1.857	11
1.321	9	1.989	12
2.048	13	4.362	17
2.073	14	4.702	18
2.821	15	5.000	19
2.985	16	5.351	20
	$R_1 = 84$		$R_2 = 126$

Note.-- U' at the .05 level of significance two-tailed test = 23

$$U = n_1 n_2 + \frac{n_2(n_2+1)}{2} - R_2$$

U = 29 not significant at the .05 level.

TABLE 10

Mann-Whitney U Test, Formula 1
Mothers Versus Fathers as Social Reinforcing
Agents with Their Preschool Sons

Father L_{F1} (n = 10)	Rank	Mother L_{F1} (n = 10)	Rank
.577	1	.834	2
.916	3	1.013	4
1.150	7	1.136	5
1.238	9	1.136	6
1.251	10	1.185	8
1.277	11	1.333	13
1.312	12	1.555	14
1.722	15	2.039	16
2.174	18	2.167	17
4.364	20	3.044	19
	$R_1 = 106$		$R_2 = 103$

Note.-- U' at the .05 level of significance two-tailed test = 23

$$U = n_1 n_2 + \frac{n_1(n_1+1)}{2} - R_1$$

U = 49 not significant at the .05 level.

TABLE 11

Mann-Whitney U Test, Formula 2
Mothers Versus Fathers as Social Reinforcing
Agents with Their Preschool Sons

Father L_{F2} (n = 10)	Rank	Mother L_{F2} (n = 10)	Rank
.671	1	.864	3
.807	2	1.068	5
.978	4	1.121	6
1.187	8	1.150	7
1.272	10	1.232	9
1.327	11	1.339	12
1.840	15	1.458	13
2.320	18	1.588	14
2.323	19	1.976	16
3.267	20	2.216	17
	$R_1 = 108$		$R_2 = 102$

Note.-- U' at .05 level of significance two-tailed test = 23

$$U = n_1 n_2 + \frac{n_1(n_1+1)}{2} - R_1$$

U = 47 not significant at the .05 level.

TABLE 12

Computations Formula 1
Boys with Fathers

Subject		Subject	
1.	$\frac{\frac{22 - 43}{22}}{\frac{23 - 47}{23}} = .916$	2.	$\frac{\frac{21 - 47}{21}}{\frac{22 - 44}{22}} = 1.238$
3.	$\frac{\frac{21 - 37}{21}}{\frac{25 - 58}{25}} = 1.238$	4.	$\frac{\frac{20 - 43}{20}}{\frac{26 - 52}{26}} = 1.150$
5.	$\frac{\frac{14 - 31}{14}}{\frac{34 - 67}{34}} = 1.251$	6.	$\frac{\frac{15 - 34}{15}}{\frac{29 - 57}{29}} = 1.312$
7.	$\frac{\frac{22 - 52}{22}}{\frac{24 - 43}{24}} = 1.722$	8.	$\frac{\frac{16 - 41}{16}}{\frac{32 - 55}{32}} = 2.174$
9.	$\frac{\frac{29 - 74}{29}}{\frac{45 - 61}{45}} = 4.364$	10.	$\frac{\frac{17 - 36}{17}}{\frac{32 - 60}{32}} = 1.277$

TABLE 13

Computations Formula 2
Boys with Fathers

Subject		Subject	
1.	$\frac{\frac{22 - 66}{22}}{\frac{23 - 70}{23}} = .978$	2.	$\frac{\frac{21 - 72}{21}}{\frac{22 - 67}{22}} = 1.187$
3.	$\frac{\frac{21 - 56}{21}}{\frac{25 - 87}{25}} = .671$	4.	$\frac{\frac{20 - 69}{20}}{\frac{26 - 74}{26}} = 1.327$
5.	$\frac{\frac{14 - 47}{14}}{\frac{34 - 97}{34}} = 1.272$	6.	$\frac{\frac{15 - 43}{15}}{\frac{29 - 96}{29}} = .807$
7.	$\frac{\frac{22 - 88}{22}}{\frac{24 - 55}{24}} = 2.323$	8.	$\frac{\frac{16 - 62}{16}}{\frac{32 - 82}{32}} = 1.840$
9.	$\frac{\frac{29 - 109}{29}}{\frac{45 - 83}{45}} = 3.267$	10.	$\frac{\frac{17 - 70}{17}}{\frac{32 - 75}{32}} = 2.320$

TABLE 14

Computations Formula 1
Boys with Mothers

Subject		Subject	
1.	$\frac{\frac{19 - 36}{19}}{\frac{28 - 58}{28}} = .834$	2.	$\frac{\frac{20 - 50}{20}}{\frac{26 - 44}{26}} = 2.167$
3.	$\frac{\frac{22 - 47}{22}}{\frac{24 - 47}{24}} = 1.185$	4.	$\frac{\frac{22 - 47}{22}}{\frac{24 - 48}{24}} = 1.136$
5.	$\frac{\frac{16 - 38}{16}}{\frac{26 - 49}{26}} = 1.555$	6.	$\frac{\frac{15 - 35}{15}}{\frac{25 - 50}{25}} = 1.333$
7.	$\frac{\frac{16 - 41}{16}}{\frac{30 - 53}{30}} = 2.039$	8.	$\frac{\frac{22 - 47}{22}}{\frac{25 - 50}{25}} = 1.136$
9.	$\frac{\frac{6 - 18}{6}}{\frac{35 - 54}{35}} = 3.044$	10.	$\frac{\frac{19 - 39}{19}}{\frac{26 - 53}{26}} = 1.013$

TABLE 15

Computations Formula 2
Boys with Mothers

Subject		Subject	
1.	$\frac{\frac{19 - 74}{19}}{\frac{28 - 69}{28}} = 1.976$	2.	$\frac{\frac{20 - 64}{20}}{\frac{26 - 77}{26}} = 1.121$
3.	$\frac{\frac{22 - 64}{22}}{\frac{24 - 77}{24}} = .864$	4.	$\frac{\frac{22 - 69}{22}}{\frac{24 - 72}{24}} = 1.068$
5.	$\frac{\frac{16 - 58}{16}}{\frac{26 - 69}{26}} = 1.588$	6.	$\frac{\frac{15 - 57}{15}}{\frac{25 - 73}{25}} = 1.458$
7.	$\frac{\frac{16 - 68}{16}}{\frac{30 - 74}{30}} = 2.216$	8.	$\frac{\frac{22 - 73}{22}}{\frac{25 - 72}{25}} = 1.232$
9.	$\frac{\frac{6 - 20}{6}}{\frac{35 - 106}{35}} = 1.150$	10.	$\frac{\frac{19 - 66}{19}}{\frac{26 - 74}{26}} = 1.339$

TABLE 16

Computations Formula 1
Girls with Fathers

Subject	Subject
1. $\dfrac{\frac{21 - 46}{21}}{\frac{25 - 48}{25}} = 1.294$	2. $\dfrac{\frac{16 - 40}{16}}{\frac{32 - 55}{32}} = 2.087$
3. $\dfrac{\frac{20 - 56}{20}}{\frac{26 - 38}{26}} = 3.900$	4. $\dfrac{\frac{20 - 40}{20}}{\frac{24 - 52}{24}} = .857$
5. $\dfrac{\frac{18 - 40}{18}}{\frac{30 - 57}{30}} = 1.358$	6. $\dfrac{\frac{13 - 38}{13}}{\frac{35 - 59}{35}} = 3.059$
7. $\dfrac{\frac{22 - 42}{22}}{\frac{23 - 50}{23}} = .774$	8. $\dfrac{\frac{17 - 39}{17}}{\frac{30 - 56}{30}} = 1.493$
9. $\dfrac{\frac{19 - 47}{19}}{\frac{29 - 50}{29}} = 2.035$	10. $\dfrac{\frac{14 - 29}{14}}{\frac{31 - 66}{31}} = .949$

TABLE 17

Computations Formula 2
Girls with Fathers

Subject	Subject
1. $\dfrac{\frac{21 - 66}{21}}{\frac{25 - 76}{25}} = 1.050$	2. $\dfrac{\frac{16 - 71}{16}}{\frac{32 - 71}{32}} = 2.821$
3. $\dfrac{\frac{20 - 79}{20}}{\frac{26 - 63}{26}} = 2.073$	4. $\dfrac{\frac{20 - 62}{20}}{\frac{24 - 77}{24}} = .951$
5. $\dfrac{\frac{18 - 60}{18}}{\frac{30 - 83}{30}} = 1.321$	6. $\dfrac{\frac{13 - 64}{13}}{\frac{35 - 81}{35}} = 2.985$
7. $\dfrac{\frac{22 - 64}{22}}{\frac{23 - 72}{23}} = .828$	8. $\dfrac{\frac{17 - 48}{17}}{\frac{30 - 94}{30}} = .854$
9. $\dfrac{\frac{19 - 74}{19}}{\frac{29 - 70}{29}} = 2.048$	10. $\dfrac{\frac{14 - 48}{14}}{\frac{31 - 92}{31}} = 1.234$

TABLE 18

Computations Formula 1
Girls with Mothers

Subject		Subject	
1.	$\frac{\frac{12 - 40}{12}}{\frac{33 - 52}{33}} = 4.057$	2.	$\frac{\frac{13 - 34}{13}}{\frac{32 - 58}{32}} = 1.988$
3.	$\frac{\frac{9 - 34}{9}}{\frac{35 - 58}{35}} = 4.226$	4.	$\frac{\frac{19 - 38}{19}}{\frac{29 - 55}{29}} = 1.116$
5.	$\frac{\frac{11 - 32}{11}}{\frac{33 - 57}{33}} = 2.625$	6.	$\frac{\frac{19 - 41}{19}}{\frac{28 - 53}{28}} = 1.297$
7.	$\frac{\frac{22 - 45}{22}}{\frac{25 - 49}{25}} = 1.088$	8.	$\frac{\frac{21 - 41}{21}}{\frac{28 - 56}{28}} = .952$
9.	$\frac{\frac{19 - 51}{19}}{\frac{27 - 43}{27}} = 2.844$	10.	$\frac{\frac{13 - 44}{13}}{\frac{34 - 51}{34}} = 4.768$

TABLE 19

Computations Formula 2
Girls with Mothers

Subject		Subject	
1.	$\frac{\frac{12 - 72}{12}}{\frac{33 - 66}{33}} = 5.000$	2.	$\frac{\frac{13 - 53}{13}}{\frac{32 - 85}{32}} = -1.857$
3.	$\frac{\frac{9 - 64}{9}}{\frac{35 - 75}{35}} = 5.351$	4.	$\frac{\frac{19 - 63}{19}}{\frac{29 - 77}{29}} = 1.398$
5.	$\frac{\frac{11 - 69}{11}}{\frac{33 - 70}{33}} = 4.702$	6.	$\frac{\frac{19 - 60}{19}}{\frac{28 - 83}{28}} = 1.098$
7.	$\frac{\frac{22 - 73}{22}}{\frac{25 - 70}{25}} = 1.287$	8.	$\frac{\frac{21 - 66}{21}}{\frac{28 - 80}{28}} = 1.153$
9.	$\frac{\frac{19 - 75}{19}}{\frac{27 - 67}{27}} = 1.989$	10.	$\frac{\frac{13 - 73}{13}}{\frac{34 - 70}{34}} = -4.362$

TABLE 20

Girls with Fathers
Raw Data

Subjects	Baseline		Reinforcement		Extinction	
	MP	LP	MP	LP	MP	LP
1	25	21	48	46	76	66
2	33	16	55	40	71	71
3	26	20	38	56	63	79
4	24	20	52	40	77	62
5	30	18	57	40	83	60
6	35	13	59	38	81	64
7	23	22	50	42	76	64
8	30	17	56	39	94	48
9	29	19	50	47	70	74
10	31	14	66	29	92	48

TABLE 21

Boys with Fathers
Raw Data

Subjects	Baseline		Reinforcement		Extinction	
	MP	LP	MP	LP	MP	LP
1	23	22	47	43	70	66
2	22	21	44	47	67	72
3	25	21	58	37	87	56
4	26	20	52	43	74	69
5	34	14	67	31	97	47
6	29	15	57	34	96	43
7	24	22	43	52	55	88
8	32	16	55	41	82	62
9	45	29	61	74	83	109
10	32	17	60	36	75	70

TABLE 22

Girls with Mothers
Raw Data

Subjects	Baseline		Reinforcement		Extinction	
	MP	LP	MP	LP	MP	LP
1	33	12	52	40	66	72
2	32	13	58	34	85	53
3	35	9	58	34	75	64
4	29	19	55	38	77	63
5	33	11	57	32	70	69
6	28	19	53	41	83	60
7	25	22	49	45	70	73
8	28	21	56	41	80	66
9	27	19	43	51	67	75
10	34	13	51	44	70	73

TABLE 23

Boys with Mothers
Raw Data

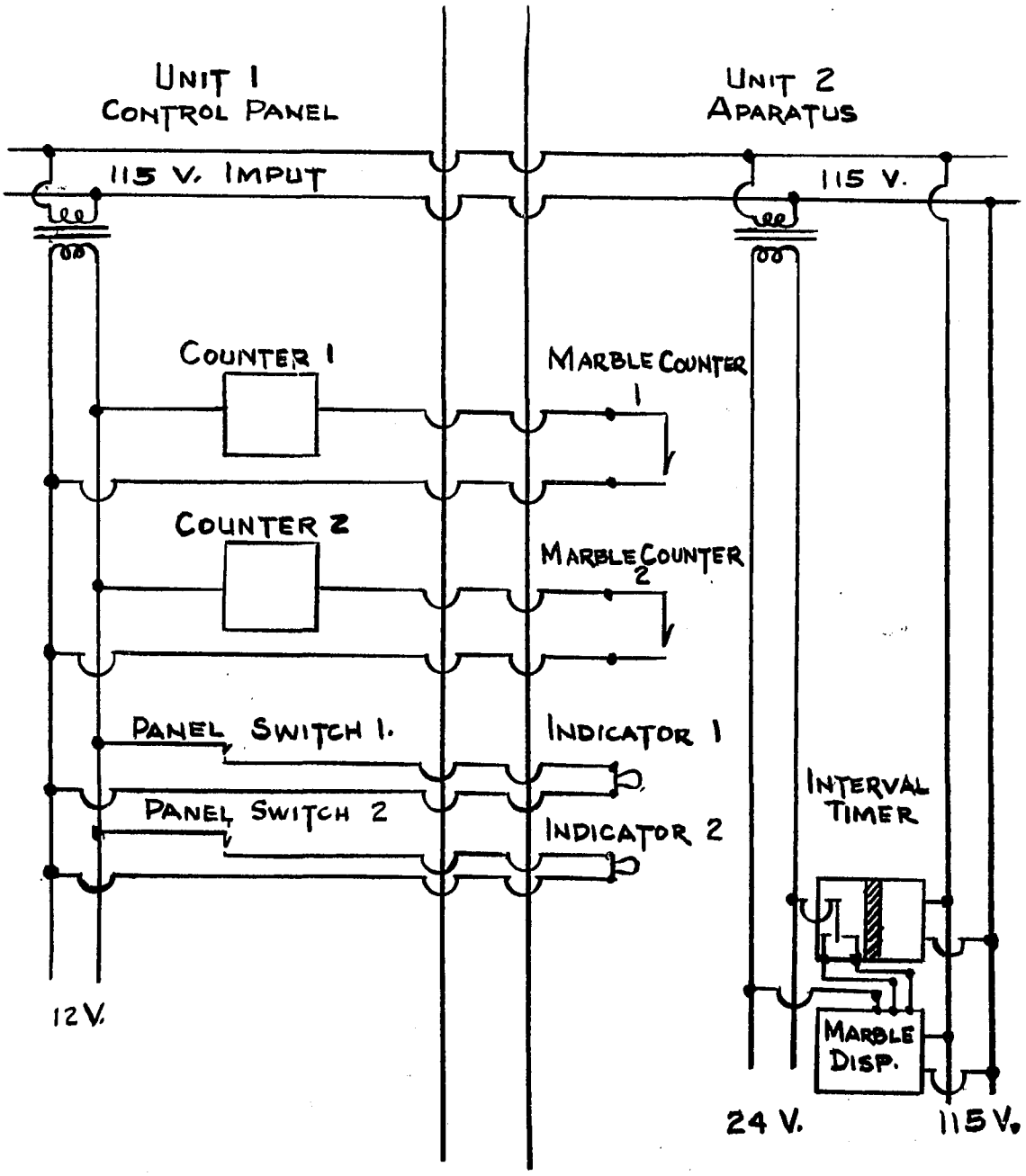
Subjects	Baseline		Reinforcement		Extinction	
	MP	LP	MP	LP	MP	LP
1	28	19	58	36	69	74
2	26	20	44	50	77	64
3	24	22	47	47	77	64
4	24	22	48	47	72	69
5	26	16	49	38	69	58
6	25	15	50	35	73	57
7	30	16	53	41	74	68
8	25	22	50	47	72	73
9	35	6	58	18	106	20
10	26	19	53	39	74	66

APPENDIX D

Apparatus

FIGURE 1

Schema of Apparatus



APPENDIX E

Correspondence Concerning Laboratory Facilities and Funds

October 12, 1969

Dr. Elmer L. Puryear
Dean of the College
Greensboro College
Greensboro, North Carolina

Dear Dr. Puryear:

I would like to request that I be allowed to use Room 100B in Cowan Building and Cowan Lobby each Saturday morning during the current semester as research facilities.

Miss Cullis of the Art Department has agreed to move her storage to another area so that Room 100B will be cleared and she assures me that the use of this space by me will be no inconvenience for her or members of her staff.

Your consideration of this matter will be greatly appreciated.

Best wishes,

J. Don Everhart
Instructor in
Psychology

JDE:mm

October 14, 1969

Mr. Don Everhart
Campus Mail

Dear Mr. Everhart:

I have your request to use Room 100B in Cowan Building and Cowan Lobby each Saturday morning during the current semester. Permission is hereby granted for this. I would appreciate it if you would see that the building is secure when you leave.

You may get the keys you requested from Mr. Bob Davis.

Sincerely yours,

Elmer L. Puryear
Dean of the College

ELP:lf

cc: Mr. Allen Wilkinson
Mrs. Louise Jones

October 14, 1969

Dr. Elmer L. Puryear
Chairman of Research Committee
Greensboro College
Greensboro, North Carolina

Dear Dr. Puryear:

Will you please place before the Research Committee my request for a cash grant in the amount of $100.00. I would like to have these funds to help with clerical and postal expenses in conducting my dissertation experiment. The experiment is in the area of verbal reinforcement at the kindergarten level and has been approved by both my committee and the graduate school at The University of North Carolina.

The following is a breakdown of my projected expenses:

1.	Postage	$50.00
2.	Clerical assistance	$50.00
	Total	$100.00

I understand that if the Research Committee sees fit to grant me these funds that I am obligated to make a full report to the Research Committee by October 1, 1970 and that any monies not used are to be returned to the Research Committee.

Sincerely yours,

J. Don Everhart
Instructor
Psychology and Education

JDE:mm

October 23, 1969

Mr. Don Everhart
Campus Mail

Dear Mr. Everhart:

The Faculty Research Committee has considered your request for $100.00 to conduct your dissertation experiment. The Committee voted to award you this money to cover postage and clerical assistance.

You are aware that we must have a report and an accounting of expenditures by October 1, 1970, but the Committee will be happy to have a report from you on your experiment at any time.

Sincerely yours,

Elmer L. Puryear
Dean and Chairman
Research Committee

ELP:lf

cc: Mr. Allen Wilkinson